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Beyond trustified capitalism: a Schumpeterian monetary analysis of the evolving relationship between innovation and finance in the U.S.

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Abstract

Schumpeter identified two alternative approaches to economics: Real Analysis and Monetary Analysis. Dissatisfied with the first, he sought to develop a Monetary Theory of economic change through time, centered on the twin forces of innovation and finance, and their evolving relationship. These themes have been largely marginalized under the neo-Schumpeterian revival, which has largely taken place under the aegis of Real Analysis. The paper attempts to recover some of these lost themes, focusing on the relationship between banking and entrepreneurship. Schumpeter's analysis of the evolution of these two forces ends with the description of U.S. trustified capitalism in the immediate post-War period. The paper continues such analysis, following the institutional developments of trustified capitalism up to the present. It is argued that trustified capitalism harmed rentiers' interests, leading to a counterrevolution in the early 1980s, spearheaded by institutional investors but enabled by the banking sector. Reorganization of corporate governance eliminated corporate financial independence, thus removing the main cause of instability of the period. Under managed money capitalism, the new regime identified by Minsky (1988), the systemic role of innovation is not to generate income in the form of entrepreneurial profits, but financial asset value, through the process described by Schumpeter as "profitless prosperity". Monetary analysis suggests that innovation is currently a driver of financialization rather than economic growth.

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Schumpeter identified two alternative approaches to economics: Real Analysis and Monetary Analysis. Dissatisfied with the first, he sought to develop a Monetary Theory of economic change through time, centered on the twin forces of innovation and finance, and their evolving relationship. These themes have been largely marginalized under the neo-Schumpeterian revival, which has largely taken place under the aegis of Real Analysis. The paper attempts to recover some of these lost themes, focusing on the relationship between banking and entrepreneurship. Schumpeter's analysis of the evolution of these two forces ends with the description of U.S. trustified capitalism in the immediate post-War period. The paper continues such analysis, following the institutional developments of trustified capitalism up to the present. It is argued that trustified capitalism harmed rentiers' interests, leading to a counterrevolution in the early 1980s, spearheaded by institutional investors but enabled by the banking sector. Reorganization of corporate governance eliminated corporate financial independence, thus removing the main cause of instability of the period. Under managed money capitalism, the new regime identified by Minsky (1988), the systemic role of innovation is not to generate income in the form of entrepreneurial profits, but financial asset value, through the process described by Schumpeter as "profitless prosperity". Monetary analysis suggests that innovation is currently a driver of financialization rather than economic growth.

1 - Introduction

Schumpeter and Keynes, the two great rivals, fought to establish the supremacy of monetary analysis in their own time. At the end of his career, Schumpeter had to admit that Keynes had won the struggle: the Keynesian revolution was driving the development of economic thought. He could however take satisfaction in observing that monetary analysis had finally established itself as the dominant mode of economic analysis; the alternative approach, physical analysis¹, was clearly in decline (Schumpeter, 1954).

It would not last. In time, both Keynes' and Schumpeter's theories would be converted into physical analysis. The well-documented deconstruction of Keynes (Leijonhufvud, 1967, 1968, 1969) happened gradually, through a series of long-fought theoretical skirmishes. Schumpeterian monetary analysis was simply neglected. Following decades of silence, the neo-Schumpeterian revival would take place from the very beginning under the resurgent flag of physical analysis (Freeman, 1974). The neo-Schumpeterian school has greatly expanded the frontier of physical analysis of innovation, but Schumpeter is still at the forefront of monetary analysis of innovation and economic growth. However, the institutional nature of Schumpeterian theory prevents its direct application to the world of today.

Original Schumpeterian theory is built on two main actors: the entrepreneur and the banker. From the very beginning, the entrepreneur has mesmerized the attention of the public: the role of the banker has been obscured, if not entirely forgotten. But it is the banker and its special relationship with the entrepreneur that gives shape to the cyclical process of economic progress.

While the entrepreneur represents the timeless creative response of humanity (Schumpeter, 1947), the banker is the hallmark of capitalism, identified with the bank-mediated credit creation system (Schumpeter, 1939: p.217). As an institution, capitalism is subject to evolutionary change: its actual mechanisms mutate over time. Aware of the issue, Schumpeter recast its theory over several alternative institutional setups, analyzing the role of the entrepreneurial function under feudalism, socialism and several capitalism varieties. In contrast with the timeless approach of physical analysis, Schumpeter described how the role of innovation changes across institutional regimes. In developing his theory, he carefully separated timeless and institutional elements, in order to propose a theory that could fit the

¹ The term physical analysis is original to the paper, as Schumpeter used the term "real analysis" to describe the alternative approach to monetary analysis. However he criticizes the terms as misleading: the label "physical analysis" is proposed here as a potentially superior alternative.

general mold of any variety of capitalism he might foresee. The most well-known and well-developed version of his theory is made to fit the competitive capitalism variant (Schumpeter, 1982), but Schumpeter acknowledged that institutional development toward a different capitalism regime, trustified capitalism, was largely completed by the '40s (Schumpeter, 1939).

Schumpeterian theory provides the natural starting point for developing a monetary theory of the macroeconomic impact of innovation, but must be adapted to current institutional realities first: this is the objective of the paper. Following the model provided by Schumpeter's *Business Cycles* (1939), the paper takes a mixed theoretical-historical approach focused on the development of financial institutions in the U.S. following the end of the Second World War. It describes the domination and fall of trustified capitalism, and the rise of what Minsky (1988) identified as "managed money capitalism" in its stead. Under the new regime, as in competitive capitalism, the entrepreneurial function is controlled by the financial sector; its objective is not income creation, but the inflation of financial assets values.

Section 2 describes the role of the banker and its relationship with the entrepreneur in Schumpeterian theory. Section 3 analyzes the historical fall of trustified capitalism, expanding the Schumpeterian elements present in the work of Hyman Minsky. Section 4 describes the most relevant features of managed money capitalism, the current regime, focusing on the role taken by innovation. Section 5 concludes.

2.1 - The relationship between innovation and finance in Schumpeterian theory: general case and competitive capitalism

Schumpeter saw contemporary economic theory as fundamentally static and indissolubly linked to the assumption of pure barter exchange (Schumpeter, 2010). These limitations made economics unable to develop a satisfactory theory of capital formation, the emergence of interest, entrepreneurial profits and economic crises. A different theory was required to understand these phenomena, based on the twin principles of endogenous economic change arising in a monetary setting. From the very beginning of Schumpeterian theory, finance and development are strictly related.

Their relationship is described in *Theory of Economic Development* (Schumpeter, 1982). Innovation and finance are co-dependent. The entrepreneur requires purchasing power in order to divert existing resources toward new uses; this is provided by the banking system through credit creation. The entrepreneurial profits resulting from successful entrepreneurial activity

are the primary source behind the emergence of a positive rate of interest, main source of income of the financial sector.

While the funding needs of the entrepreneur are immediately recognizable, an argument for the causal link between innovation and interest must be built. Schumpeter initially advances a purely theoretical argument. In the pure static economy the interest rate on credit creation for investment purposes is equal to zero: physical resources are optimally allocated by assumption; it is not possible to obtain any additional gains through rearrangement of the production process. For a positive rate of interest to emerge, it is necessary to relax this last assumption, to allow the entrepreneurial function to operate. The entrepreneur is then able to generate profit expectations from the qualitative modification of the current production structure. The banker validates these expectations by creating the necessary purchasing power required to carry the innovative process through. Expected profits generated by endogenous change allow the entrepreneur to borrow and the banker to lend at a positive rate of interest (Schumpeter, 1982).

This theory met with substantial critique that failed to convince Schumpeter. However it pushed him to develop an alternative approach that does not require full acceptance of his theory of interest while retaining the fundamental relationship on which his general theory is built, based on an analysis of the economic role of the banking sector, whose main elements are described in *Business Cycles* (1939).

The objective of the banker is to extend credit at a profitable interest rate, given funding costs. Credit contracts transform income flows generated in the process of physical production in interest payments commitments to the bank, with corporate profits being the dominant potential source of interest income. However, while new entrants are dependent on external funding, established firms can use retained earnings as internal funds to achieve a measure of financial autonomy, lowering funding costs in the process. In general, the autonomous, successful firm has an incentive to minimize its capital costs, leading to declining financial income. This creates a fundamental conflict of interests between the banking sector and the nonfinancial corporate sector. The incumbent productive sectors have an intrinsic incentive to minimize financial costs, while the financial sector aims to maximize the income generated by its services.

This alternative approach is compatible with Schumpeterian interest theory without requiring it. It also underlines the main reason for the alliance between the entrepreneur and the banker: both draw their income from disruption of the existing order. The relationship between development and finance is a cornerstone of the general Schumpeterian theory of economic

development in a capitalist economy, but the actual form taken by this relationship depends on the institutional setup of the economy under analysis.

Schumpeter applies his theory to the particular case of *competitive capitalism*, the institutional setup that he believed closer to reality at the beginning of his research (Schumpeter, 1982). The entrepreneurial function is assumed to be performed by individuals, while corporate ownership and management is family-based. Barriers to entry are generally low, and, as a result, social mobility among the elite is relatively strong.

In this environment, the strategy deployed by the banking sector is to fund new entrants to challenge the incumbent structure of production. Successful entrants are debt-financed, and the competitive pressure exerted also contribute to increase the role of external funding for the incumbents. As new entrants have an incentive to reduce their funding costs, the banking sector will continuously fund new entrepreneurial waves. From this perspective, the entrepreneurial function is used as an instrument by the banking sector to preserve its long-term profitability. If the entrepreneur is the agent of change, the banker is the instigator. This is one of the reasons why Schumpeter focused on disruptive rather than marginal innovation: the banker needs to significantly weaken internal and external coordination of existing producers in order to achieve her goals.

2.2 - The relationship between innovation and finance in Schumpeterian theory: trustified capitalism and its consequences

In the later stage of his career, Schumpeter became dissatisfied with the ability of competitive capitalism to describe contemporary practices. Markets were dominated by substantially autonomous large corporations, using internal funding to perform the entrepreneurial function inside organizational borders. The incumbent economic structure was much less susceptible to innovation-based, bank-funded competition from new entrants. He called this emerging institutional setup trustified capitalism (Schumpeter, 1939).

While Schumpeter never produced a complete adaptation of his theory to the new institutional setup, he presented two general hypotheses. First, the new regime was likely to result in a much more stable economic system. The marginalization of the banking sector would damp the pathological phenomena connected with the creative destruction process. This diminished volatility would not have to be accompanied by a lower economic performance; in fact, lack of financial disruptions was likely to result in an improved rate of improvement of general living

standards. From a purely economic perspective, trustified capitalism was to be considered superior to the competitive variant. The second conclusion was that trustified capitalism would eventually result in the end of capitalism: a gradual end by reform rather than revolution, but an end nonetheless. The argument behind this potentially surprising conclusion is provided in *Capitalism, Socialism and Democracy* (2013).

The economic basis of the argument is found in the basic conflict of interest between finance and physical production. Under trustified capitalism, the oligopolistic firms internalize the entrepreneurial function, degrading the ability of the financial sector to disrupt the movement toward minimization of financial costs. The money capitalists of Schumpeterian theory are condemned to a slow death by starvation. With a progressively failing capitalist class and no rationalistic political support, capitalism is fated to be gradually reformed into something different.

Schumpeter's prophecy of a gradual slide into socialism has not been borne out by history. But many elements of his analysis have proved correct. Trustified capitalism did create a period of essentially stable prosperity, accompanied by pronounced financial repression. This economic golden age was accompanied by increasing sociopolitical call for reform instead of cheerful approval of the status quo. Labour organizations and leftist intellectual and political movements grew in strength and influence. The economic success of the new regime did not seem sufficient to ensure untroubled survival. Both the economic and political legs of Schumpeter prediction came true. Perhaps a longer rule of the managerial regime would have brought further substance to Schumpeter's vision. Instead of gradual political reform, trustified capitalism was brought down by the creative response of the financial sector.

2.3 – Trustified capitalism in the US: historical experience and theory

Schumpeter did not live to witness the heyday and fall of trustified capitalism. The experience of the first two postwar decades largely support Schumpeter's prediction of stable and sustained economic growth; the period is usually referred to as the Golden Age of capitalism (among others: Marglin and Schor, 1991; Crafts, 1995; Temin, 2002).

The empirical investigation of the period conducted by Nordhaus et al. (1974) brings additional empirical validation of Schumpeter's vision. Between 1945 and 1974, the corporate sector was generally able to achieve and maintain an oligopolistic structure. Administered prices based on

markup over current costs allowed firms to achieve substantial control on the amount of internal resources generated. Secondly, the nonfinancial sector was able to lower the cost of capital: from a peak of 12 percent in 1949, the cost of capital had declined to little over 4 percent in 1960. The sector was largely in control both of internal and external funds, arbitraging between both to minimize funding costs. Despite this particularly strong position, the corporate sector as a whole experienced essentially zero net profitability. Nordhaus comments the result as “most surprising (...) given popular notions about monopoly power, and the undoubted existence of supernormal returns to major inventions and knowhow” (*ibid*: p.198). What happened to all the oligopoly profits and technological rents, Nordhaus asks, wondering if perhaps these returns were wasted by inefficient firms. Coherently with the Solovian model of economic growth, innovation is characterized as an exogenous source of systemic growth and corporate profits. Empirical experience confronted dominant economic theories with apparently unsolvable puzzles. Recognition of this fact allowed the emergence of alternative theoretical frameworks.

The Megacorp and Oligopoly (1976), by Alfred Eichner, provided a microeconomic foundation compatible with both Schumpeterian theory and empirical data. The Megacorp described by Eichner, is characterized by managerial dominance, financial independence and monopolistic co-respective competition. The consequences of these three assumptions explain many of the “mysteries” encountered by Nordhaus. The size of the markup practiced by the oligopolistic firm, the megacorp, is determined as a function of the funding requirements of the planned level of investments. The empirical experience of almost zero net profits, surprising to neoclassical theory, validates Eichner’s approach, in which the rate of profit is administratively set in order to be sufficient to finance further expansion. Expansion is maximized under long-term constraints imposed by the need to maintain strong barriers to entry and minimize substitution effects among the customer base.

Eichner’s theory also contains an analysis of the distributive consequences of trustified capitalism. The megacorp is the arena where the distribution of the private economy output is decided. Eichner identifies two most important constituencies facing management: workers, represented by trade unions, and stockholders. The megacorp is able to effectively resist the rentier’s requests, reflected in the declining capital costs recorded by Nordhaus et al. (1974). However, as the main source of income of the megacorp is the process of physical production, organized labour can effectively promote its own interests. As Eichner notices, the pricing

power of the megacorp allows it to accommodate labour requests without sacrificing its investment plans, as increased unit costs are added to the final pricing decision. This provides an explanation for the main distributional movements of the Golden Age. The rapidly improving incomes and living conditions of the working class, and the accompanying decline in inequality measurements, were due to the retained ability of labour to effectively influence management, in opposition to a declining ability of the financial sector to do the same. In the first phase, labour gains were offset by corresponding rentier losses, as capital income steadily decreased. Once capital income reached its lowest point, labour demands added to the inflationary pressures of the period.

Eichnerian theory of the firm does not include an analysis of the innovation process. However, the Megacorp can be readily identified with the “innovative firm” analyzed by Lazonick (1993; 2003; 2010) Lazonick’s theory provides the missing piece required to explain the last Nordhaus’s mystery: the lack of net profitability accompanying a veritable wave of innovation. Innovation is not exogenous to the economic process. It is the result of the activity of innovative firms. Guided by a financially autonomous managerial class, raised through internal promotion, the corporate sector was able to generate and commit the financial and human resources needed to conduct the entrepreneurial function. The returns generated by product and process innovations were re-invested to achieve managerial growth objectives, generating substantial compensations for the workforce in the process.

The theory of the megacorp and of the innovative firm provide a description of how the large corporation, the main actor of trustified capitalism, performed the productive and entrepreneurial functions. Their assumptions are entirely coherent with Schumpeterian theory and, taken together, provide a good explanation of the empirical profile of the U.S. trustified capitalism experience. In order to understand how this regime was overturned, it is necessary to turn to the analysis of the evolution of U.S. financial and banking sectors, following the trace left by Minsky.

3.1 – A Schumpeter/Minsky approach to the evolution of finance

The adoption of Schumpeterian ideas happened in the later stage of Minsky’s career (Minsky, 1990). It is here that for the first time Minsky, inspired by “Schumpeterian insight” introduces his classification of the stages of capitalist financial development for the first time, echoing the Schumpeterian “capitalist regimes” of old. His previous work seamlessly integrated in the new

conceptual framework, leading to an expansion, rather than a confutation, of his past convictions (see for example Ferri and Minsky, 1992). However, the historical analysis of the evolution of trustified capitalism was completed by Minsky in his *Stabilizing an Unstable Economy* (Minsky, 1986) published right before the beginning of his Schumpeterian phase. This section will expand Minsky's analysis along Schumpeterian lines, using additional empirical material to support the extended argument. The objective is to provide a Schumpeterian interpretation of the original Minskyan analysis, close in spirit to the late Minsky's contribution.

3.2 Trustified capitalism and finance: main features and starting conditions

Minsky identifies three main features as characteristic of the immediate post-War period: concentration of corporate decision-making power in the hands of management, a substantially larger government sector, and a Central Bank able to intervene to stabilize both domestic and international liquidity crises, acting as a Lender of Last Resort (Minsky, 1986). As a legacy of the War, the Treasury bill had become the main position-making asset. The Federal Reserve organized a private dealer-based market for government debt and, following the so-called Treasury Accord, accepted full responsibility for orderly conditions in this market, thus making government debt the main source of refinance in time of need.

The first two decades of the regime are described by Minsky as financially stable, as testified by the lack of systemic crises. From a Schumpeterian perspective, the fact requires an explanation, as managerial capitalism should enforce duress on the financial sectors. This explanation is found in the short-term sustainability of the initial response of the banking sector to the managerial squeeze: sustained non-corporate lending.

Between 1946 and 1965, the banking sector, cut off from business income, expanded its lending to household and local government entities. The fast pace of credit expansion was enabled by the particularly low debt level of these two sectors following the War and the sustained economic growth experienced during the period. Government debt soon proved to be insufficient in supporting the expansion, leading to the creation of the federal-funds market, which by the middle of the 1950s became a commonly used position-making instrument. Under managerial capitalism, high rates of credit expansion were the main driver of financial

innovation, leading to the emergence of several new types of financial instruments, a process usually described as the birth of liability management².

The decline in the rate of growth of state and local, household and corporate indebtedness in the 1960s coincided with increased instability of financial markets. From the theoretical perspective outlined above, this signals the failure of the accommodating strategy pursued by the banking sector. Faced with new institutional constraints, banks initially adapted to the system by expanding in the direction left open to them. The strong expansion rate allowed by very stable initial conditions steadily increased the indebtedness of households and local government. Raising borrower and lender risk eventually constrained the rate of credit expansion; the systemic buffers created by the war economy were depleted. The banking sector faced a profitability crisis without any solution inside the institutional boundaries. As a result, new innovative strategies became dominant: the banking sector started to modify its assigned role in the institutional setup and instability ensued.

3.3 – Manifest instability: 1960s and 1970s

The period of financial instability inaugurated with the credit crunch of 1966 is directly linked to the process of credit expansion allowed by the creation of new financial assets outside the stabilizing influence of the Federal Reserve. While the proximate cause of instability is found in the financial sector at large and banking in particular, as underlined by Minsky, Schumpeterian theory recognizes the financial autonomy of enterprises as the ultimate cause. This autonomy provided the starting point for the long process of euthanasia of the rentier, predicted by Schumpeter and Keynes. But the rentier would not go gentle into that good night. Financial instability was the result of the attempt of the banking sector to adapt to a mutated environment in which its past strategies could no longer work. The key reason behind the economic success of managerial capitalism was also the ultimate cause of his decline.

In need to increase profitability on lending activities, in 1961 the banking sector introduced the large-denomination certificate of deposits. The market for the new instrument grew rapidly, allowing banks to lower the amount of required reserves in relation to total assets and increase profitability. In the meantime, operating under two major stimuli, Vietnam War government expenditures and tax reforms aimed at limiting the impact on the former on the fiscal budget (Burger, 1969), nonfinancial corporations increased borrowing from the financial sector.

² See Wray (1999) for a critical perspective on the emergence of liability management.

Corporate demand for credit was interest rate inelastic; average realized and expected profit rates in the corporate sector were higher than the interest rate, as expected in trustified capitalism. In order to finance their rapidly expanding balance sheets, large New York banks bid up the interest rate on certificates of deposits, recently become their main funding instrument. The Federal Reserve initially accommodated the request of the banking sector by raising the interest rate ceilings on bank loans. The high pace of credit expansion forced the Federal Reserve to lift the ceilings three times in three years: July 1963, November 1964 and December 1965. Finally, in July 1966, the Federal Reserve refused to lift the ceilings further, putting pressure on banks to lower the pace of credit expansion.

Unable to raise the rates on commercial lending, the New York banks raised the interest rates on loans for dealers in municipal bonds, impairing the ability of the latter to expand their positions. In effect, the market for municipal bonds suddenly disappeared. With the municipal bonds market impaired, certificate of deposits trading at a discount in the secondary market and a Federal Reserve unwilling to accommodate funding requests for corporate credit expansion, the banking sector had no choice but to limit corporate lending, resulting in the credit crunch of 1966. At this point, the Federal Reserve guaranteed finance for current holdings of municipal securities to all banks willing to constrain business loans' expansion. The market for municipal bonds revived and the panic ended. The resulting large decrease in investment associated with the crunch did not lead to a fall in aggregate income because of increased military spending related to the Vietnam War.

Irrespective of which analytical approach is favored (Burger, 1969; Minsky, 1986; Wolfson, 1986; Dickens, 1999), it is uncontested that the origin of the crisis lied in the profitability of the banking sector. The credit crunch of 1966 is particularly important for three reasons. As Minsky (1986) points out, it is the first postwar systemic financial crisis of the United States. Hindsight allows us to recognize that it coincides with the beginning phase of a long-term process of redistribution of nonfinancial corporation profits toward interest payments (Kliman, 2015). This signals a turning point in the ability of managerial capitalism to effectively control internal funds. Lastly, it shows the active role taken by the profit-seeking financial sector in instigating institutional and financial change. In 1966 the Federal Reserve managed to temporarily achieve its objective of limiting bank lending to the corporate sector. What the Federal Reserve could not do, however, was restoring the financial conditions of the previous decade; after the crisis, the financial sector would again face the same profitability issue. The

Lender of Last Resort function is effective in restoring pre-crisis conditions. As long as the crisis is exogenous, it will restore stability to the system. But endogenous instability will persist.

The crisis of 1970 demonstrates the point. A detailed account is provided by Schadrack and Breimyer (1970). Following the credit crunch of 1966, firms dramatically escalated their issuance of commercial paper. The high level of long-term interest rates practiced by the chastised banking sector pushed corporations to meet their financing needs in short-term markets. Commercial paper was used by nonfinancial firms to achieve low capital costs in the face of rising interest rates: from 1967 to early 1969 commercial paper costs were generally 30 to 60 basis points below prime. By developing an alternative source of external funds, the nonfinancial sector was actually increasing its autonomy from banks as a source of direct funding. The increased reliance on external funds was only apparent: nonfinancial corporations were the principal purchasers of commercial paper. Corporate treasurers substitute commercial paper for their holdings of money stocks, government securities and time deposits. The nonfinancial sector was increasing its autonomy from commercial banks in both assets and liabilities management. Being entirely in line with trustified capitalism's institutional setup, this development did not raise alarm among monetary and financial authorities. The problems started when banks entered the fray.

After the credit crunch, banks resumed their credit expansion, steadily driving the interest rates on large CD toward the ceiling, eventually reached at the end of 1968. This elicited a creative response, taking the form of entrance in the commercial paper market for funds through subsidiaries and affiliates, such as bank holding companies. The intermediate layer was needed to avoid interest rate ceilings. The innovation proved successful: in few months more than 2 billions dollars worth of commercial paper were placed on the market. The Federal Reserve took notice and started acting to contain the movement. However, no direct action was taken until August 17, 1970, when commercial paper was made subject to reserve requirements. In the meantime, the banking sector did not follow the request of the Federal Reserve and the volume of commercial paper outstanding increased rapidly. By summer the central bank lifted the ceiling rates on CD, thus offering an alternative funding channel to the banking sector, and the market for bank-based commercial paper started to wane.

In June 21 the Penn Central Transportation Company, the nation's largest railroad and sixth largest nonfinancial corporation, filed bankruptcy, with \$82 million of commercial paper outstanding. Due to the current liquidity squeeze applied on the banking sector, liquidity

concerns generated a major run on commercial paper. The Federal Reserve took immediate action, opening the discount window to all banks willing to support the commercial paper market. The suspension of interest rate ceilings on large short-term CDs further increased funds availability for the banking sector. By late July the crisis was over. To ease the pressure on nonbank commercial paper market, the central bank subjected bank-related commercial paper to reserve requirements, thus inducing a sharp contraction of the already declining market sector. While the crisis led to a recession, the emergence of large government deficit in 1970, 1971 and 1972 contained its scale.

The 1970 crisis is notable for several reasons. The combined intervention of Big Government and Big Bank in 1966 failed to restore the stable initial conditions: two years after 1966, banking credit expansion had driven CD interest rates to the ceiling again. This was inevitable, given that, despite a credit crunch in the middle of the decade, the average annual rate of increase of commercial bank assets during the 1960s was 9 per cent, with growth in the dollar value of GNP trailing behind at 7 per cent (Burns, 1974). In order to maintain profitability, the banking sector surpassed the rate of expansion of the economy at large, generating instability in the process. The Federal Reserve was correct in identifying this excessive credit expansion as a source of instability. The immediate response was to try to fight this expansion, as in 1966. This strategy could be successful only in the shortest term. The crux of the matter is that trustified capitalism is not compatible with a profit-seeking banking system. Financial autonomy of corporations slowly starves the banking sector; the latter reacts through a mix of quantitative expansion (assets growth) and qualitative change (financial innovation). Unwilling to accommodate banking expansion, the Federal Reserve exacerbated the profitability problem of the banking sector.

In quelling a source of instability, the central bank was creating another one. With the credit creation ability of the banking sector effectively constrained, an important systemic source of liquidity was impaired. Savers were unwilling to hold illiquid assets, thus generating the run of 1970³. The related crisis is relevant because, while the ultimate source is still found in the inability of the banking sector to achieve profitability under stable trustified capitalism conditions, the trigger is ultimately provided by savers. It is the latter's refusal to hold nonbank paper that precipitates the crisis, and the subsequent intervention of the Federal Reserve. The

³ Many of these «savers» were corporate treasurers. Commercial paper substituted liquid assets such as deposits and Treasuries. This did not reflect a diminished liquidity preference; the movement was liable to reverse quickly in case of perceived liquidity issue, as indeed happened in 1970.

event is especially significant as, for the first time the Federal Reserve recognized that stable financial markets required the banking sector to be able to act as a liquidity source, a role requiring in turn unconstrained credit creation ability (Schadrack and Breimyer, 1970: p.290). Consequently the central bank accepted “faster than desirable” growth of bank assets, effectively securing short-term stability at the expense of long-term fragility. It would be simplistic to interpret this fundamental shift as a victory of the banking sector. Immediately before the crisis, the Federal Reserve was committed to constraining the expansion of the banking sector, as in 1966. Institutional change was triggered by the run on commercial paper: the Federal Reserve hand was forced by investors, not by bankers. The faster rate of expansion desired by the latter was accepted only because it was deemed necessary for supporting the development of direct finance. In this way, the 1970 crisis laid the foundations for future evolution of the banking system.

The first consequences of these changes were immediately visible. In a speech addressed at the American Bankers Association in 1974, the Chairman of the Board of Governors of the Federal Reserve, Arthur F. Burns, confronts developments taking place in the banking industry (Burns, 1974). During 1971-1973, banking assets grew more than 15 per cent per year, far outstripping growth of bank capital. Sustained expansion was obtained at the price of deterioration in the quality of bank assets. The 1973 oil crisis increased corporative demand for external funds, reinforcing existing trends. Nine out of ten of the largest U.S. bank failures recorded at the time happened between 1971 and 1976 (Sinkey, 1977). Throughout the period, the Federal Reserve acted as a Lender of Last Resort, avoiding a systemic financial crisis, despite the 1974-1975 recession and widespread financial fragility.

The new strategy deployed by the Federal Reserve obtained the desired result of avoiding systemic crisis. The banking sector was allowed to grow at the desired pace in exchange for a firm commitment to support fringe banking institutions (Minsky, 1975). Insolvency in the banking sector was resolved through quick combined intervention of fiscal and monetary authorities. Financial assets and liabilities generated in the expansionary phase were not allowed to wipe during crises, leading to increased accumulation of dollar balances and dollar-denominated assets across the international financial system. This new domestic compromised exacerbated the international difficulties of the dollar, leading directly to the run from the dollar of 1979 (Minsky, 1986b). The analysis of the resulting crisis, dominated by international rather

than domestic concerns⁴, falls largely outside the aim of this paper. While the 1980s saw the downfall of the trustified capitalism regime, the main reason is not provided by the Volcker shock, but by the long-term changes taking place in the ownership structure of the U.S. economy.

3.4 – The rise of the institutional investor

The rise of the institutional investor went fundamentally unnoticed until it made its presence forcefully known in the 1980s. An early witness, Peter Drucker, titled its book on the subject *The Unseen Revolution* (1976). By that time, pension funds owned circa 25 percent of the equity capital of the American business.

A creature of managerial capitalism, pension funds went largely unnoticed as they were largely compatible with the structure of the then dominant regime. For decades, pension funds took in more money in contributions that they had to pay as pensions, thus providing a steady flow of funds for U.S. firms, contributing to low equity costs, especially for large firms, whose stock performance was consequently significantly lower than smaller firms. Pension funds also were sizable silent shareholders, providing further support to unabated managerial control of the nonfinancial sector.

Drucker believes the process to be unsustainable. Long-term demographic trends will inevitably slow down, and eventually reverse, the flow of funds going from the workers to the firms, thus inevitably creating a conflict of interests between firm managers and money managers. The conflict could be made worse by the second conflict of interest between current workers, favoring productive investment and expansion, and retired workers, requiring higher dividends to achieve their expected pensions. In hindsight, the claim that U.S. society would have to modify its views on what consists an “acceptable” unemployment level seems to have been substantially confirmed.

But Drucker is also critical of the situation in 1976. He identifies three main constituencies behind large enterprises: the consumer, the present employees, and the investors (Drucker, 1976: p.83). Drucker accuses American management to have neglected consumer interest, instead supporting “producer interests”. In particular, management has been willing to pass over to employees the income generated by new technology, higher investments and increased

⁴ A perspective shared by Volcker on the eve of assuming the role of Chairman of the Board of Governors of the Federal Reserve (Volcker, 1978).

productivity. Drucker's label "consumer interests" is potentially misleading. The majority of consumers are workers and therefore beneficiaries of managerial capitalism. The only clear losers are the non-producing consumers: the rentiers. Under these terms, Drucker's analysis is consistent with the Schumpeterian view.

Drucker was among the first to identify in the ownership structure the critical weakness of managerial capitalism. Writing 35 years after Schumpeter's prophecy, Drucker confirms the Schumpeterian scenario of a gradual, bloodless slide from successful trustified capitalism into democratic socialism. If the outcome is the same, the mechanism is certainly different: economic governance revolution instead of political reform. At least on the outcome, Drucker was proved wrong. Pension funds could not achieve a revolution in economic governance, as they were prevented by law from achieving control of their investments. Faced by regulatory ceilings and the need to achieve good results despite underperforming stock markets, the 1970s saw pension funds moving away from equities into debt-based instruments. By the 1980s, pension funds invested only 25% of their new funds in equities (Kaufman, 1986: p.168).

Pension funds were not the only institutional investors on the rise. Unsatisfactory interest rates offered by ceiling-constrained banks, pushed savers toward alternative solutions. Between 1960 and 1980, more and more funds came under control of professional money managers of various kinds. While investment was diversified, by 1980 household owned directly only 60,9 percent of total U.S. equities. In 1950 they owned 91,6 percent (Kaufman, 1986).

While institutional investors were gaining strength, government made industrial deregulation a key goal. The movement started under Carter's Administration with the Airline Deregulation Act in 1978 and gained further stimulus under Reagan. During the same period antitrust enforcement was substantially eased, as the revision of merger guidelines of 1982 by the Justice Department shows. Furthermore, the authorities were lax in their enforcement of the more tolerant regulations (Shleifer and Vishny, 1997).

While the emergence of "junk bonds" would attract the attention of commentators throughout the period, the wave of debt-financed restructuring of corporation that took place in the 1980s could not have taken place without the active and committed support of the banking sector. Borio (1990) describes how the banking sector provided around 50 percent of the funding required by all restructuring activities of the period. While non-US bank also participated, especially in the later stages of the wave, large US banks dominate the overall picture. Banks have been involved at multiple levels: they originated deals, arranged loan syndications,

actively bought and sold loans and took part in financing all debt tranches. As expected by Schumpeterian theory, the motivation cited by US bankers for their involvement has been the erosion of their corporate lending business (OCC, 1989). In particular, the emergence of a positive spread between costs of funds for large banks and large corporations (Borio, 1990), coupled with the strategic shift of the Federal Reserve for a more accommodative stance toward asset quality deterioration, pushed banks toward supporting highly leveraged transactions and pursuing off-balance-sheet fee-based income flows.

The M&A wave of the 1980s was allowed by the emergence of institutional investors, supported by deregulation and lax enforcement but motivated by the underlying friction between banks and corporation in the US managerial regime. The analysis of available empirical evidence confirms this perspective. Mitchell and Mulherin (1996) corroborate two stylized facts of the wave: takeover activity in the period was widespread and largely targeted at large firms. Analyzing a sample of firms comprising more than 60 percent of the value of listings on the NYSE, AMEX and NASDAQ as of year-end 1981, they found that 57 percent of them experienced a takeover attempt between 1982 and 1989. The scope of takeover activity is sufficient to justify the attribution of systemic importance to this process.

Academic debate on the reasons behind the sudden boom in takeover activities focused on the contrast between a positive view, usually championed by financial economists, and a negative view advanced by industrial economists (a summary is provided by Browne and Rosengren, 1987). A major point of contention revolved around the claim that takeover activity was motivated by managerial inefficiency and that, through corporate restructuring and market discipline, a more efficient corporate sector would result. The evidence does not fully support this perspective. Kaplan (1989) and Kaplan and Stein (1993) find that buyout firms made large cuts in their capital expenditures, despite no evidence of overinvestment before the hostile takeover (Servaes, 1994). Additionally, no significant changes in the ratio of capital expenditures to sales follow the takeover (Healy et al., 1992; Bhagat et al., 1990). Herman and Lowenstein (1988) finds that target firm were not underperforming; many of them were large, financially healthy, well-managed companies with established market positions. Studies attempting to identify efficiency gains from M&A activities using different methodologies failed to identify substantial evidence in favor of the hypothesis (Rhoades, 1994; Pilloff and Santomero, 1996; Peristiani, 1997). Furthermore, the National Science Foundation, in a large study examining the R&D expenditures of the 200 largest R&D performing firms of the time,

found that all restructured companies reduced their R&D spending, while non-restructured companies increased spending in the same period (NSF, 1989).

Empirical evidence do not support the hypothesis that takeovers increased firm efficiency, thus eliminating a possible explanation for the large increase in share prices associated with takeover activities. Gompers et al. (2001) also rejects the smart institutional investors hypothesis and provides an alternative explanation: changes in equity prices are explained best by the compositional shift in ownership toward institutional investors. This hypothesis also explains the disappearance of the historical small-company stock premium in favor of a new large-company premium. However it remain to be explained why institutional ownership could be valued by markets. A potential explanation is provided by capital costs.

Already in 1983, in a hearing before the joint economic committee of the Congress, Hatsopoulos (1983) warned of rising american costs of capital, especially in comparison with the main industrial competitors, Germany and Japan. In 1985, the President's Commission on Industrial Competitiveness found that rising capital costs – not inferior technological performance – were to blame for the Japanese incursion into the U.S. semiconductor industry. In 1989 the Federal Reserve produced a comparative analysis of cost of capital in U.S., United Kingdom, Japan and Germany (McCauley and Zimmer, 1989). The report confirmed the increasing capital costs gap between the United States and its main competitors, especially in regard to funding for R&D projects with a 10 year payoff lag.

Holmstrom and Kaplan (2001) notices that, by forcefully increasing leverage, LBOs force high capital costs on management. The Free Cash Flow theory of takeovers developed by Jensen (1987) is based around the conflict between managers and shareholders. Free cash flow is generated when management is forced to discount all firm's projects at the cost of capital favored by shareholders. Managerial autonomy leads to lower costs of capital; by reducing managerial autonomy, takeovers restore higher capital costs, thus leading to the emergence of "free", or, more accurately, "freed" cash flows, to be paid out to shareholders. The higher costs of capital are fixed in place through leverage as "Debt creation, *without retention of the proceeds of the issue*, enables managers effectively to bond their promise to pay out future cash flows" (*ibid*, p.113-114) The proceeds must be used to buy back stocks, thus cementing managerial commitment to higher capital costs. The only limit to the issuance of debt is provided by agency costs, especially bankruptcy risks, although in some cases overleveraging can also be a profitable strategy for shareholders.

It is unclear how a more leveraged, yet cash-poor firm might be more efficient in its operations. In fact, despite evidence of increased operative profits in buyout companies (Kaplan 1989; Smith 1990; Kaplan and Stein, 1993) during the first half of the decade, roughly one third of the leverage buyout completed after 1985 defaulted on their debts (Kaplan and Stein, 1993). In general rising bankruptcies accompanied the leveraging process in the US, while deleveraging in Japan was accompanied by declining bankruptcy risks (McCauley and Zimmer, 1989). The leverage motive behind takeover activities of the period is also hinted by the fact that targets were relatively conservative in their financing before corporate restructuring (Palepu, 1985; Bartley and Boardman, 1986).

The evidence described above supports the hypothesis that the main objective of the 1980s M&A wave was corporate governance change, as suggested by several researchers (among others: Lazonick, 1992; Donaldson, 1994; Friedman, 1996; Holmstrom and Kaplan, 2001). Enabled by substantial bank sector support, activist institutional investors were able to eliminate managerial autonomy and the resulting drive toward rentier euthanasia. Equity gains following buyouts were primarily motivated by a debt-based long-term shift toward investors' interests and away from producers' interests, rather than forecasted efficiency gains. While a number of additional contingent motivations have certainly played an important role, the systemic perspective adopted in this article recognizes the 1980s M&A wave as a paradigmatic change away from managerial/trustified capitalism toward a new regime. In recognition of the active role of institutional investment in bringing this development forward, Minsky called the new regime "managed money capitalism".

4.1 – The current regime according to Minsky: managed money capitalism

Minsky noted the rise of the importance of institutional investors taking place in the second half of the 1970s (Minsky, 1980), but did not foresee at that time the role that they would play. After witnessing the takeover wave of the 1980s, however, he recognized its paradigmatic importance. Following the rediscovery of Schumpeter, Minsky described the need of the international monetary framework to face the emergence of managed money capitalism (Minsky, 1988). His description of the new regime would not substantially change over time, although it would be progressively refined into a more stylized description (Minsky, 1996).

According to Minsky, the basic characteristics of the new regime are the following. The dominant proportion of the corporations' liabilities, both equity and debt, are held by

institutional investors. The stated aim of the latter is to maximize the value of the investments of the holders of their liabilities, by maximizing total returns on assets, the combination of dividends, interest received and capital gain. Money managers are locked in constant competition to achieve the highest possible returns on their investment, or at least to beat the average performance. As a result, they are especially sensitive to market valuations and have no reason to refuse bids for their shares that are at premium to current prices. The emergence of block trading and securitization, whose potential fragility had been already diagnosed by Minsky (Minsky, 1986b), are now described as consequences of the new regime and its demands on the financial system (Minsky 1990; 1993). Another consequence is increased financial volatility: financial fluctuations can dominate trade balances in the determination of exchange and interest rates (Minsky, 1988). Despite the hype, multinational corporations are of declining importance compared to multinational ownership structures.

The Schumpeterian framework developed throughout this article allows us to expand our understanding of the current capitalist regime beyond this Minskyan frame. Our analysis on the role of managed money in taming, and therefore changing, managerial capitalism agrees with Minsky in assigning to institutional investor a key role in the current institutional setup. However, this must not come to obscure the co-protagonist of the Schumpeterian narrative: the banking sector. Institutional investors are borne out of the conflict between finance and production under managerial capitalism, and their coming to power is enabled by the financial innovation spearheaded by banks. By forcing higher capital costs on business, money managers solve the existential threat to the financial sector at large and the banking sector in particular. The evolution of the latter is pushed in the direction of creation and support of disintermediated financial markets: fees rather than interest as a source of income.

How does this fit the Schumpeterian narrative? In competitive capitalism, banks finance innovation in order to counteract managerial authority and capital costs minimization. In trustified capitalism firms internalize the entrepreneurial function while banks search for alternative income sources. In money manager capitalism however, innovation is present both inside and outside the borders of the firm. However, as financial income is ensured through effective control of corporate governance, innovation is not an instrument against the established firm: its role is not to produce profits, but to be capitalized.

4.2 – Innovation today: “profitless prosperity”

Schumpeter introduces the concept of “profitless prosperity” to describe how the innovation process may take place in absence of entrepreneurial profits. Under competitive capitalism, entrepreneurial profits arise due to the potential difference between commodity market price of physical means of production and asset market price of capital as expected returns; in Minsky’s terms, the difference between the supply and demand price of capital.

The main reason behind this potential difference is Knightian uncertainty (Knight, 1921). The key feature of innovation, «newness» necessarily implies uncertainty. When past calculation of time and/or space average do not provide a statistically reliable estimate of current of futures space/time averages, the environment can be defined as nonergodic (Davidson, 1988). In a nonergodic environment the future is uncertain and financial markets cannot be expected to correctly price assets according to their fundamentals (Bernstein, 1988).

Given the fundamentally uncertain nature of the innovation process, potential for entrepreneurial profits always exists. While physical differences in efficiency or quality provide the opportunity for entrepreneurial profits to arise, the financial structure of the economy determines the form they take. Under competitive capitalism, expected profits are realized through successful market competition. Profits eventually disappear, either through price competition or capitalization. In the first case, equilibrium between the supply and demand prices of capital is brought through a reduction in the demand price: competition drives profits down. In the second case, equilibrium is achieved through an increase in the supply price of capital. However this does not take place in the physical commodities market, but in the market for financial assets.

Schumpeter never adopted the assumption of perfect competition in the development of his theory, as he considered it entirely unrealistic; “it cannot exist at all” (Schumpeter, 2010, p.189). Accordingly, the “suicidal stimulus of profits” (Schumpeter, 1939), takes place even in a completely monopolistic situation, through adjustment of the financial asset price of capital.

While uncertainty prevents financial market to correctly price in expected profits from innovation activities, actual realization of profits change the picture. As effective competition reveals the value of the innovative technology, method, product or strategy, the market price for equity of the innovative firm will increase to match the revealed profitability. As the innovative firm establishes itself, the newness-related uncertainty disappears, allowing financial markets to bridge the gap between supply and demand prices of capital. The price of

equity increases until it matches expected returns; while the level of profits does not change, the price of capital increases until the rate of profit loses its exceptional status. In this case entrepreneurial profits are eliminated through capitalization.

The two process of competition and capitalization are complementary: the final distribution of the price changes will determine how the social returns of innovation are distributed between consumers, employees, management, shareholders and investors.

Under competitive capitalism, entrepreneurial profits appear in the monetary framework as temporary realized profits, gradually eliminated by competition. Under profitless prosperity entrepreneurial profits do not appear, as expectations are capitalized well in advance of actual profit realization. As early capitalization is not based on income, it requires money creation and must therefore take place during the prosperity phase of the cycle, as implied by the name “profitless prosperity”.

In order to become dominant, this innovation regime requires the presence of financial markets both able and willing to successfully operate under uncertainty. The Keynesian theory of financial markets provides an explanation of the underlying mechanisms.

4.3 – Innovation and liquidity: the Venture Capital Industry

Uncertainty relates to the future: the longer the process, the more uncertain its final outcome. The innovation process usually requires long-term commitment (Lazonick, 2005). Additionally, physical investment is almost irreversible: markets for second hand production factors rarely exist, and wages cannot be taken back. The entrepreneur can be guided by her specific technological or market knowledge to maintain expectations, but such knowledge can hardly be credibly communicated to the investor. The task to evaluate the long-term potential of an innovative investment without any specific knowledge on the subject is, quite simply, impossible. The solution is provided by liquidity.

If the investor has the ability to be able to reverse her investment decision quickly at low costs, then the dilemma facing the investor is much different. The question becomes: is the market price of the financial asset likely to be higher or lower in any preferred period? While certainly not trivial, the question is one that can potentially find a credible answer, thus allowing the use of financial risk management instruments. Uncertainty is not removed, but its potential impact is lessened.

Required is a financial institution able to transform the long-term irreversible physical investment into a liquid, short-term financial asset. From its humble beginnings, the U.S. Venture Capital industry has developed to fulfil this role.

Up to the late 1970s, the U.S. venture capital industry was largely inconsequential (Liles, 1977). In 1979 the U.S. Department of Labor modified the interpretation of its “prudent man” rule to allow pension funds manager to invest in high-risk assets, including venture capital. Total commitments to the industry were multiplied, with pension funds behind the majority of investments (Gompers and Lerner, 2001). Capital commitments rose twenty-fold between 1991 and 2000, with institutional investors leading the charge (Gompers and Lerner, 2004).

After languishing for decades, the Venture Capital industry was revitalized by the emergence of institutional investors (Kortum and Lerner, 2000). The sector provided the necessary liquid channel for early capitalization of innovation activities. The m.o. of the industry is coherent with Schumpeterian theory. Unlike non-venture initial public offerings, the typical venture-backed offering is unprofitable (Barry et al., 1990). Venture-backed offerings tend to take place during market peaks (Lerner, 1994) and inflow of funds positively affects valuation levels of private equity transactions (Gompers and Lerner, 2000): besides technological opportunities, venture investments are affected by purely financial factors.

It has been argued that the development of the venture capital industry in the U.S. is a consequence of the existence of a well-developed stock market with low barriers to entry (Black and Gilson, 1998). This stock market allows venture capitalists to exit through an initial public offering (IPO) instead of selling the portfolio firm, thus giving the entrepreneurs the option to retake control of the firm. The possibility of an IPO can be seen as an implicit contract over control.

The argument is not entirely convincing, for two reasons. The liberalization of capital movements has greatly lowered the requirements for foreign firms to use the advanced U.S. or British stock markets, yet few continental European firms have taken this opportunity. Secondly, stock markets are not required for entrepreneurs to achieve control of the firm after exit of venture capital; leverage managerial buyback is a feasible alternative strategy, one commonly pursued in Europe (EVCA, 2014). It can be argued that this option is not feasible for the fast-growing, capital-consuming firms that are the focus of venture capital investing in the U.S. (Black and Gilson, 1998); but the argument would require an explanation for the different focus, which is simply absent.

Access to well-developed stock markets is neither lacking nor unique in terms of options offered to entrepreneurs and cannot by itself explain the rise of the U.S. venture capital industry. Schumpeterian theory can.

In countries where managerial capitalism still hold, venture capital is marginal, largely an extension of standard banking activities. Interest remains the main source of income for the banking sector; accordingly, exit from portfolio companies is accomplished through company's repurchase of the venture fund stake, resulting in debt rather than capitalization. Mezzanine financing instruments are usually employed to assist the firms in developing the necessary income flows to service debt.

Under money manager capitalism, institutional investors and the banking sector act together with the objective to create financial assets and inflate their values. Just as corporate governance, the venture capital industry is restructured in order to serve the new objectives of the financial sector. Firm are selected according to their innovation potential in integration with the current market structure, not necessarily on their viability as individual income producing units. The financial markets signal their ability to support exits through increased funding to the venture capital industry, that reacts through earlier exits and increased commitments. The venture capital industry expands cyclically, following short-term capital movements (Gompers and Lerner, 2004).

4.4 – The macroeconomic role of innovation in managed money capitalism

In Schumpeterian theory the entrepreneurial function is necessary for the banking sector to create, support and expand its main income source. This is true under competitive and managed money capitalism both. With origination and support of financial markets becoming the main source of profits for the U.S. banking sector and institutional investors taking control of corporate governance, innovation has been harnessed to contribute to the process of capitalization commonly described as financialization.

While innovation is definitely in, creative destruction is out. In absence of managerial autonomy, the banking sector does not need to attack current capital structure, nor corporations are driven to minimize their financial obligations. Destruction of both money and capital is not required. The new systemic role of innovation is to contribute to the continuous creation of financial assets. As the process is divorced from income growth, financial markets' expansion

requires positive net money creation by the banking sector to proceed. The result is an entirely financial long-term cycle (Borio, 2014), punctuated by bubble episodes localized in specific financial markets. The new dependence of innovation on financial markets' expansion confers to the entrepreneurial function a procyclical nature. This novel characteristic is tempered by the presence of auxiliary capitalization channels available when financial markets are out of order: the corporate sector. When IPOs are unpractical, venture capitalists can sell the portfolio company to established firms; under money management capitalism, the corporate sector has become a complementary source of liquidity for the capitalization process.

The consequences are visible in balance sheets. Economists have noticed the build up in cash-equivalents in the U.S. corporate sector (Foley et al., 2007; Bates et al., 2009; Ennis and Wolman, 2012), especially in comparison with non-U.S.-based multinational firms, describing the phenomenon as a puzzle (Pinkowitz et al., 2012). While precautionary motives and taxation laws may be playing a role, Schumpeterian theory provides a stronger explanation. Cash tends to accumulate especially in technologically advanced firms, large and small (Sanchez and Yurdagul, 2013). Under competitive capitalism, startups minimize the debt they need to take in order to grow; under managed money capitalism, startups aim toward maximization of investors commitments: the ultimate goal is to generate the highest possible inflow of funds through an IPO. As a result, excess liquidity accumulates in their balance sheet. Large companies accumulate cash to ensure liquidity for their stocks. By creating large cash reserves and committing to sizable buyback initiatives, multinationals can become market makers for their own equity, thus enhancing their liquidity. Additionally, large cash holdings guarantee the ability to acquire any innovative firm of value being brought to the market by the venture capital industry. The accumulation of financial assets over physical investments is not the consequences of a short-term focus; it is an integral part of current long-term corporate development strategies.

From our monetary perspective, under managed money capitalism there is no direct link between innovation and economic growth. The sustained and successful efforts of the U.S. national innovative champions, such as Silicon Valley, are reflected in the amazing growth of financial markets: financial value creation, rather than production, is the outcome of innovation activity. This result, following from theoretical considerations and institutional analysis, is entirely in line with the practical experience of today's entrepreneurial activity, from its early-stage elevator pitches to potential investors, to its IPOs. How this strong relationship has been

largely obscured is a testament to the pervasiveness of the physical approach to economics of innovation.

5 – Conclusions

The paper proposes an adaptation of Schumpeterian theory to the current institutional framework. It describes the role of the banking sector in the competitive capitalism framework used by Schumpeter in the development of his theory. It shows how managerial capitalism breaks the link between the entrepreneur and the banker, leaving the latter bereft of the main instrument of income generation. This fundamental break is placed at the center of a long-term explanation of the financial evolution of the United States after the end of the Second World War, following Minsky's historical analysis. The Schumpeterian vein present in Minsky's late contributions is enlarged and show to be complementary with his earlier works. The roots of the current regime are found in the rise of institutional investors and their bid for corporate governance during the anomalous M&A wave of the 1980s. Managerial capitalism has been replaced by a new regime, managed money capitalism. To the Minskyan interpretation, the paper adds a description of the pivotal role played by the banking sector.

The paper also provides a description of the present relationship between banker and entrepreneur. Schumpeter briefly described the outline of such relationship under the label of "profitless prosperity". Instead of realizing entrepreneurial profits in order to pay interest, the role of innovation is to generate profit expectations to be capitalized as financial assets, before entrepreneurial profits can materialize. Separated from income creation and dependent on money creation, the entrepreneurial function takes place entirely during the prosperity phase.

A minor phenomenon in Schumpeter's times, profitless prosperity is the dominant form taken by the entrepreneurial function under managed money capitalism. Schumpeterian theory thus provide an institutional explanation for the rise and the mechanisms of the U.S. venture capital industry provides the channel required by institutional investor to fund innovative activities while retaining liquidity.

The analysis concludes by describing the new systemic role of innovation today. Without managerial autonomy to fight, the financial sector does not require innovation to work as creative destruction anymore. What is required is continuous capitalization instead, in cooperation with the fully integrated corporate sector. Freed from corporate barriers, innovation has become a spectacle. Everyone is invited to become an entrepreneur, to try her

luck and test her skills in the open market. Successful entrepreneurs attain wealth and significant media exposition. Innovation studies flourish, and government implement regional, national innovation strategies, signed by newly founded Innovation Agencies.

But the link between innovation and economic growth is severed. Profitless prosperity brings ever increasing financial assets and liabilities, not increased income. A theory of innovation that ignores the role of the financial sector is oblivious to this. From a purely physical perspective, nothing has changed: innovation remains the main driver of economic growth. The response to weakened growth must be more innovation. But in the monetary economy we live in, this is not a recipe for income growth. It is a recipe for accelerated financialization. A monetary theory of innovation is required to acknowledge and confront this fact.

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